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⑭ 発明の名称 電子部品製造用粘着剤付弾性材シート及び積層型チップ部品の製造方法

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## 明 細 書

## 1. 発明の名称

電子部品製造用粘着剤付弾性材シート及び積層型チップ部品の製造方法

## 2. 特許請求の範囲

(1) 弾性材層と、粘着剤層を少なくとも有する電子部品製造用粘着剤付弾性材シート。

(2) 粘着剤層は発泡性材層を介して設けられていることを特徴とする請求項1記載の電子部品製造用粘着剤付弾性材シート。

(3) 弾性材層は分離可能に設けられていることを特徴とする請求項1又は2記載の電子部品製造用粘着剤付弾性材シート。

(4) 複数の電子回路要素塗膜を形成したセラミックグリーンシートを複数枚重ねた重ね体の少なくとも1つを圧着することによりそれぞれの重ね体の圧着積層体を形成し、該圧着積層体を個々の回路単位毎に分割するダイシングを行う工程を経て積層型チップ部品を得る積層型チップ部品の製造方法において、上記圧着しようとする重ね体毎

に請求項1ないし4いずれかに記載の電子部品製造用粘着剤付弾性材シートをそれぞれの圧着積層体に粘着剤層が接合するように介在させて圧着することを特徴とする積層型チップ部品の製造方法。

## 3. 発明の詳細な説明

(産業上の利用分野)

本発明は、積層型チップ部品として例えば積層型コンデンサを得る際に、複数の内部電極塗膜を形成したセラミックグリーンシートの複数枚を重ね合わせた重ね体を圧着して圧着積層体とするときの圧着方法を改善した積層型チップ部品の製造方法及びこれに用いる電子部品製造用粘着剤付弾性材シートに関する。

(従来技術)

セラミックグリーンシートは、積層セラミックコンデンサを得る場合等に用いられるものであって、セラミックの原料粉末を樹脂等のバインダーと混合しシート状に成形したものである。これを積層セラミックコンデンサにするには、その複数枚がその主面に電極を形成してから積層されて焼

成される。

ところで、積層セラミックコンデンサの寸法は数ミリメートル単位であるので、これらが一度に多数得られるように、多数の内部電極塗膜を形成した大きなセラミックグリーンシートを積み重ね、この重ね体をさらに多数組重ねて圧着し、得られたそれぞれの圧着積層体を個々のコンデンサの単位に分割してから焼成することが行われている。

この際、重ね体の相互の間及び両端には離型紙が挟み込まれ、相互に融着したり、プレス機のプレス面にセラミックグリーンシートが付着しないようにしている。また、圧着積層体を分割するときは、分割した個別体が離散しないように、粘着シートに圧着積層体の一端面を接着させた後、カッターで裁断する、いわゆるダイシングを行っている。

このようにセラミックグリーンシートの重ね体相互間に離型紙を挟んで圧着する工程と、これにより得られた個々の圧着積層体に粘着シートを接着させてダイシングをする工程を行なうと、前者

の工程でプレス機が必要となるのみならず、後者の工程でも圧着積層体と粘着シートとの接着を確実にするためにプレス機が必要となり、これらの工程を連続的に行おうとすると2台のプレス機が必要となる。また、これらのプレス機で作業を行う場合には金型にセラミックグリーンシートの重ね体あるいは圧着積層体を装荷する手間が必要となり、粘着シートの接着工程を必要とすることと併せ、作業能率を悪くする。

このような欠点を改善するために、セラミックグリーンシートの重ね体をその一端及びそれぞれの重ね体の間に粘着シートを介在させて金型に装荷し、プレス機でプレスした後、得られた個々の圧着積層体をダイシングすることも行われている。

(発明が解決しようとする課題)

しかしながら、このように粘着シートを接着させる工程をセラミックグリーンシートの重ね体の圧着工程で行っても、この重ね体は内部電極塗膜がそれぞれのセラミックグリーンシートを介してその中央部分で重なる部分と、セラミックグリー

ンシートの1層おきにその左右両端部に交互に内部電極塗膜が引き出されている、いわゆるエンドマージン部分と、セラミックグリーンシートのみ、いわゆるサイドマージン部分のそれぞれにおいて厚さが異なる。

そのため、圧着時にセラミックグリーンシートの重ね体全体に均一な圧力が加わらず、① 内部電極塗膜がセラミックグリーンシートから離れる(デラミネーション)場合があり、また、② 圧着積層体をダイシングして得たチップの内部電極塗膜の重なる積層部分は内部電極を内包しないサイドマージンの積層部分に比べて強度が弱い、という問題点がある。

(課題を解決するための手段)

本発明は、上記課題を解決するために、弾性材層と、粘着剤層を少なくとも有する電子部品製造用粘着剤付弾性材シートを提供するものである。この際、粘着剤層は発泡性材層を介して設けられていることも好ましく、また、弾性材層は分離可能に設けられていることも好ましい。

また、本発明は、複数の電子回路要素塗膜を形成したセラミックグリーンシートを複数枚重ねた重ね体の少なくとも1つを圧着することによりそれぞれの重ね体の圧着積層体を形成し、該圧着積層体を個々の回路単位毎に分割するダイシングを行う工程を経て積層型チップ部品を得る積層型チップ部品の製造方法において、上記圧着しようとする重ね体毎に上記の電子部品製造用粘着剤付弾性材シートをそれぞれの圧着積層体に粘着剤層が接合するように介在させて圧着することとを特徴とする積層型チップ部品の製造方法を提供するものである。

(作用)

弾性材層と粘着剤層を有する電子部品製造用粘着剤付弾性材シートを介在させて回路要素塗膜を有するセラミックグリーンシートの重ね体を圧着し圧着積層体を形成すると、この重ね体が回路要素塗膜の有無によって厚さが異なっても、圧着の際に圧力を弾性材層の存在により均一化することができる。

## (実施例)

次に本発明の一実施例を説明する。

第1図に示すように、セラミックグリーンシート1、1・・・にその両側及びその左右端部に交互に余白を残して内部電極塗膜2、2・・・を形成してこれらを積み重ね、内部電極塗膜がセラミックグリーンシートを介してその中央部で重なり、かつセラミックグリーンシート1層ごとに内部電極塗膜が左右端部に引き出されるようにする。

なお、セラミックグリーンシートはポリビニルブチラールをバインダーとしたセラミック材料のスラリーをドクターブレード法等により形成したもので、これに導電ペーストをスクリーン印刷することにより内部電極塗膜が形成される。

上記の内部電極塗膜付きのセラミックグリーンシートは、40枚が積み重ねられて重ね体3が形成される。第4図に示すように、これらの重ね体3、3が金型の下型4の型枠5内に収容されるがこの際下型4の底部に離型紙(シリコン化合物等の離型剤処理したもの)6を敷き、その上に第2

図に示す電子部品製造用粘着剤付弾性材シート7を重ね合わせる。

この電子部品製造用粘着剤付弾性材シート7は、基材フィルム7a、弾性材シート7b、発泡粘着剤層7cを粘着剤等で貼り合わせたもので、不使用時は剥離容易なセパレータ7dが発泡粘着剤層7c上に設けられており、これを剥離して使用される。上記基材フィルムとしては、ポリエチレンテレフタレート等が、また、上記弾性材シートとしては伸縮性を有するもので、例えば、ポリプロピレン等の発泡体から得られるものが好ましい。

上記発泡粘着剤層としては、約100℃位に加熱すると発泡する発泡材料に粘着剤を塗布したもので、例えば日東電工社製ニットー発泡はく離性シートNO.3195シリーズが挙げられる。

上記電子部品製造用粘着剤付弾性材シート7は第4図において発泡粘着剤層7cを上側にして用いられ、その上に上記重ね体3を重ね、さらにその上に上記と同様の離型紙6を重ねる。次に剛直な中敷板8を重ね、その上に上記と同様に離型紙6、

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電子部品製造用粘着剤付弾性材シート7、重ね体3、離型紙6を順次積み重ね、その上に金型の上ふた9を装着し、加熱しながら押圧する。

このようにすると、重ね体3、3は圧着されるが、その際電子部品製造用粘着剤付弾性材シート7、7の弾性材シート7bが存在するので、内部電極塗膜2、2・・・がセラミックグリーンシートのそれぞれの層間に存在する場合、その1層ごとに存在する場合、セラミックグリーンシートのみしか存在しない場合で重ね体に厚みに差異があっても、これらの差異による重ね体を受ける圧力の差異をその弾性により緩和し、その圧力を均一化する。

このようにして重ね体3、3を押圧した後、上ふた9を外し、型枠5内のものを取り出すと重ね体3、3は圧着積層体として得られるが、離型紙6、6は容易に分離できるので、圧着積層体には電子部品製造用粘着剤付弾性材シート7が接着したままになっている。

これをダイシング工程に送り、ここでダイシン

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グを行うと、個々のコンデンサ単位毎の圧着積層体が電子部品製造用粘着剤付弾性材シート7に付着したままで得られる。この状態で約100℃に加熱し、上記発泡粘着剤層7cを発泡させて個々の圧着積層体をこのシートから剥離する。このようにして得られた個々の圧着積層体は焼成工程等を経てセラミックコンデンサが完成される。

上記の電子部品製造用粘着剤付弾性材シート7は、弾性材シート7bを分離できないものであったが、第3図に示すように弾性材シート7bと発泡粘着剤層7cの間に粘着剤層7eと、基材フィルム7fを順次積層して介在させ、上記重ね体の圧着工程では弾性材シート7bを備えたまま使用し、ダイシング工程では基材フィルム7fを粘着剤層7eから切り離し、基材フィルム7fと発泡粘着剤層7cからなる複合シートに接着させた圧着積層体をダイシングするようにしても良い。このようにすると、弾性材シートが存在しその変形によりダイシング作業が不安定になることを避けることができる。

上記電子部品製造用粘着剤付弾性材シート7は

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積層セラミックコンデンサを製造する場合に用いたが、セラミックコンデンサの製造工程におけるマスキング、一般電子部品の製造工程における表面の保護用にも用いられる。これらの場合も他のものと接触するときはその緩衝用等として有効である。また、積層ICチップ部品の製造の際にも用いられる。

(発明の効果)

本発明によれば、弾性材層を有する電子部品製造用粘着剤付弾性材シートを用いて回路要素塗膜付きのセラミックグリーンシートの重ね体を圧着するようにしたので、圧着工程では回路塗膜の重なる程度の相違による応力の不均一を緩和するとともに、グイシング工程では粘着シートを取りつける作業を必要とすることなく、その作業を行うことができる。このため、従来の粘着シート接着工程を圧着工程に含めて処理できるため、同じ作業を行うのに従来の67%の作業時間に節約することができるとともに、例えば積層コンデンサの圧着積層体を得るときの内部電極塗膜の剥離現象や、

焼成して得られた積層セラミックコンデンサの内部電極の有無による強度の不均一を避けることができる。

4. 図面の簡単な説明

第1図は内部電極塗膜を有するセラミックグリーンシート重ね体の断面図、第2図は本発明の一実施例の粘着剤付弾性材シートの断面図、第3図は他の実施例の粘着剤付弾性材シートの断面図、第4図は本発明の一実施例の方法により圧着積層体を製造する工程を示す断面図である。

図中、7bは弾性材シート、7cは発泡粘着剤層、3は重ね体、7は電子部品製造用粘着剤付弾性材シートである。

平成2年3月27日

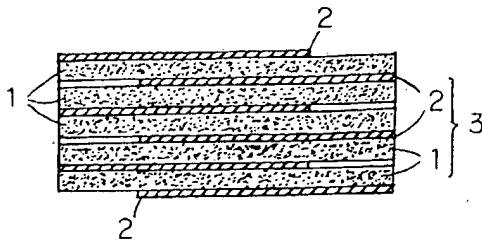
特許出願人 太陽誘電株式会社

代理人 弁理士 佐野 忠

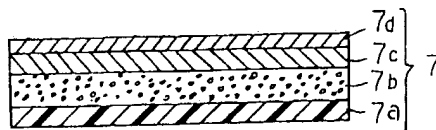


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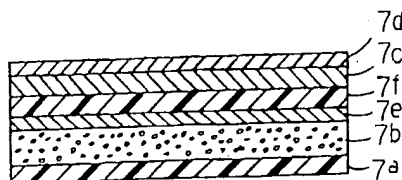
第1図



第2図

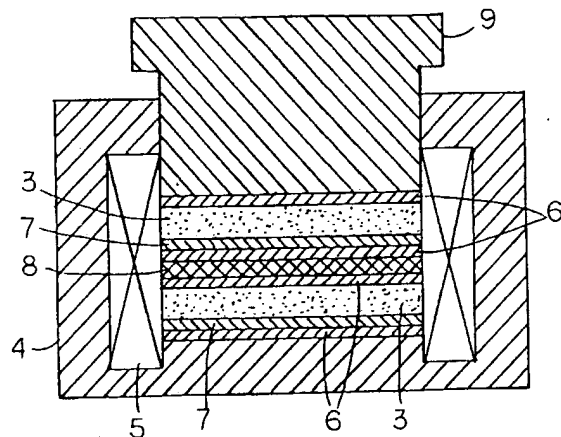


第3図



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第4図



4/3,K/1 (Item 1 from file: 347)  
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03613810 \*\*Image available\*\*  
PRESSURE-SENSITIVE ADHESIVE ELASTIC SHEET FOR MANUFACTURING ELECTRONIC PART  
AND MANUFACTURE OF LAMINATED TYPE CHIP PART

PUB. NO.: 03-276710 [JP 3276710 A]  
PUBLISHED: December 06, 1991 (19911206)  
INVENTOR(s): SHIOZAWA KEISHIN  
TOSAKA SHOICHI  
TAKAHASHI AKIRA  
APPLICANT(s): TAIYO YUDEN CO LTD [359306] (A Japanese Company or  
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APPL. NO.: 02-075473 [JP 9075473]  
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JOURNAL: Section: E, Section No. 1176, Vol. 16, No. 97, Pg. 30, March  
10, 1992 (19920310)

PRESSURE-SENSITIVE ADHESIVE ELASTIC SHEET FOR MANUFACTURING ELECTRONIC PART  
AND MANUFACTURE OF LAMINATED TYPE CHIP PART

#### ABSTRACT

PURPOSE: To equalize pressure in the presence of an elastic material layer  
on contact bonding by interposing a pressure-sensitive adhesive  
elastic sheet for manufacturing an electronic part with the elastic  
material layer and a pressure-sensitive adhesive layer, contact-  
bonding the superposed body of ceramic green sheets with  
circuit element films and forming a contact- \*\*\*bonded\*\*\* \*\*\*laminate\*\*\*

...  
...CONSTITUTION: The slurry of a \*\*\*ceramic\*\*\* material using polyvinyl  
butyral as a \*\*\*binder\*\*\* is formed through a doctor blade method, etc., in  
a \*\*\*ceramic\*\*\* \*\*\*green\*\*\* \*\*\*sheet\*\*\*. Forty \*\*\*ceramic\*\*\*  
green sheets  
with inner electrode coating are superposed, thus forming a superposed body  
3. These...

...are received in the forms 5 of the bottom force 4 of a mold. but  
release paper 6 is spread on the bottom of the bottom force 4 at that  
time...

... pressure-sensitive adhesive elastic sheets 7 for manufacturing an  
electronic part are stacked onto the \*\*\*release\*\*\* paper 6. A base material  
film 7a, an elastic material sheet 7b and a foamed pressure-sensitive  
adhesive layer 7c are \*\*\*laminated\*\*\* by adhesives, etc., in the  
pressure-sensitive adhesive elastic sheet 7 for manufacturing the  
electronic  
?

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L1: Entry 2 of 2

File: DWPI

Dec 6, 1991

DERWENT-ACC-NO: 1992-029289

DERWENT-WEEK: 199954

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TITLE: Ceramic green sheet for layer-built capacitor has foamed adhesive layer on elastic layer NoAbstract Dwg 4/4

INVENTOR: SHIOZAWA K; TAKAHASHI A ; TOSAKA S

PRIORITY-DATA: 1990JP-075473 (March 27, 1990)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
<input type="checkbox"/> JP 03276710 A	December 6, 1991	JA
<input type="checkbox"/> JP 2979330 B2	November 15, 1999	JA

## INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	H01 G 4/12	20060101
CIPS	H01 G 4/30	20060101

ABSTRACTED-PUB-NO: JP 03276710 A

## BASIC-ABSTRACT:

Amorphous magnetic alloy fine wire, having circular sections, is made by one pass wire drawing with 20-35 % redn. of area, just before a given dia. fine wire is obtd.

USE - Used for making a circular section amorphous magnetic alloy fine wire for use as a magnet core for sensors, inductors, and transformers, having high permeability over a wide frequency range. @ (3pp Dwg.No. 0/1)

ABSTRACTED-PUB-NO: JP 03276710 A

## EQUIVALENT-ABSTRACTS:

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L1: Entry 1 of 2

File: JPAB

Dec 6, 1991

PUB-NO: JP403276710A

DOCUMENT-IDENTIFIER: JP 03276710 A

TITLE: PRESSURE-SENSITIVE ADHESIVE ELASTIC SHEET FOR MANUFACTURING ELECTRONIC PART AND MANUFACTURE OF LAMINATED TYPE CHIP PART

PUBN-DATE: December 6, 1991

## INVENTOR-INFORMATION:

NAME

COUNTRY

SHIOZAWA, KEISHIN

TOSAKA, SHOICHI

TAKAHASHI, AKIRA

US-CL-CURRENT: 361/321.1

INT-CL (IPC): H01G 4/12; H01G 4/30

## ABSTRACT:

PURPOSE: To equalize pressure in the presence of an elastic material layer on contact bonding by interposing a pressure-sensitive adhesive elastic sheet for manufacturing an electronic part with the elastic material layer and a pressure-sensitive adhesive layer, contact-bonding the superposed body of ceramic green sheets with circuit element films and forming a contact-bonded laminate.

CONSTITUTION: The slurry of a ceramic material using polyvinyl butyral as a binder is formed through a doctor blade method, etc., in a ceramic green sheet. Forty ceramic green sheets with inner electrode coating are superposed, thus forming a superposed body 3. These superposed bodies 3, 3 are received in the forms 5 of the bottom force 4 of a mold. but release paper 6 is spread on the bottom of the bottom force 4 at that time, and pressure-sensitive adhesive elastic sheets 7 for manufacturing an electronic part are stacked onto the release paper 6. A base material film 7a, an elastic material sheet 7b and a foamed pressure-sensitive adhesive layer 7c are laminated by adhesives, etc., in the pressure-sensitive adhesive elastic sheet 7 for manufacturing the electronic part, a separator 7d easily peelable on nonuse is formed onto the foamed pressure-sensitive adhesive layer 7c, and the sheet 7 is used by peeling the separator 7d.

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2. Texts in the figures are not translated and shown as it is.

Translated: 04:05:43 JST 02/12/2008

Dictionary: Last updated 01/18/2008 / Priority:

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**CLAIMS**

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**(57) [Claim(s)]**

[Claim 1] It is the elastic material sheet with the adhesive for electronic-parts manufacture which has an elastic material layer and an adhesive layer at least, and pastes up the worked object for electronic parts on this adhesive layer. It is the elastic material sheet with the adhesive for electronic-parts manufacture characterized by preparing the above-mentioned adhesive layer through the fizz material layer which foams to the above-mentioned worked object for electronic parts which contacts this adhesive layer by heating so that it may exfoliate from this adhesive layer.

[Claim 2] It is the elastic agent sheet according to claim 1 with the adhesive for electronic-parts manufacture characterized by preparing the elastic material layer possible [ separation ].

[Claim 3] The sticking-by-pressure layered product of each heavy object is formed by [ which piled up two or more ceramic green sheets in which two or more electronic circuit element coats were formed ] piling up and sticking at least one of the bodies by pressure. In the manufacture method of laminated type chip parts of obtaining laminated type chip parts through the process which performs dicing which divides this sticking-by-pressure layered product for each circuit unit of every The manufacture method of the lamination chip type chip parts characterized by making it intervene so that an adhesive layer may paste up an elastic material sheet according to claim 1 to 3 with the adhesive for electronic-parts manufacture on each sticking-by-pressure layered product for every pile object which it is going to stick [ above-mentioned ] by pressure, and being stuck by pressure.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[Industrial Application]

This invention as laminated type chip parts when [ for example, ] obtaining laminated type

KONDESA It is related with the elastic material sheet with the adhesive for electronic-parts manufacture used for the manufacture method of laminated type chip parts and this which have improved the sticking-by-pressure method when piling up, sticking the body by pressure and considering it as a sticking-by-pressure layered product of having piled up two or more sheets of the ceramic green sheet in which two or more internal electrode coats were formed.

[Description of the Prior Art]

A ceramic green sheet is used when obtaining a lamination ceramic condenser, it mixes the precursor powder end of ceramics with binders, such as resin, and fabricates it in the shape of a sheet. In order to make this into a lamination ceramic condenser, it is laminated and calcinated after two or more of the sheets form an electrode in the principal surface.

By the way, since the size of a lamination ceramic condenser is several millimeter unit accumulating the big ceramic green sheet in which many internal electrode coats were formed so that much these may be obtained at once -- this heavy object -- further -- many -- calcinating, after being stuck by pressure in piles and dividing several sets of each obtained sticking-by-pressure layered product into the unit of each capacitor is performed.

Under the present circumstances, mold release paper is put between between mutual and the both ends of a heavy object, it welds mutually or the ceramic green sheet is kept from adhering to the press side of a pressing machine. Moreover, after pasting up the end side of a sticking-by-pressure layered product on a pressure sensitive adhesive sheet so that the divided individual object may not be dispersed when dividing a sticking-by-pressure layered product, what is called dicing judged by a cutter is performed.

Thus, the process stuck between [ of a ceramic green sheet ] heavy objects by pressure on both sides of mold release paper, If the process which is made to paste up a pressure sensitive adhesive sheet on each sticking-by-pressure layered product obtained by this, and carries out dicing is performed In order to ensure adhesion with a sticking-by-pressure layered product and a pressure sensitive adhesive sheet also at the latter process for a pressing machine to to be not only needed at the former process, but, when a pressing machine is needed and it tries to perform these processes continuously, two sets of pressing machines are needed. Moreover, in working with these pressing machines, the time and effort which equips a metallic mold with the heavy object or sticking-by-pressure layered product of a ceramic green sheet is needed, and it combines with needing the adhesion process of a pressure sensitive adhesive sheet, and working capacity is worsened.

In order to improve such a fault, after making a pressure sensitive adhesive sheet intervene between the end and each heavy object, equipping a metallic mold with the heavy object of a ceramic green sheet and pressing it with a pressing machine, carrying out dicing of each obtained sticking-by-pressure layered product is also performed.

[Problem(s) to be Solved by the Invention]

However, even if it performs the process made to equip with a pressure sensitive adhesive sheet in this way at the sticking-by-pressure process of the heavy object of a ceramic green sheet. The portion with which, as for this heavy object, an internal electrode coat overlaps in a part for that central part through each ceramic green sheet, Thickness differs what is called in each of what is called an end margin portion in which the internal electrode coat is pulled out by turns by the right-and-left both ends every other [ of a ceramic green sheet ] layer, and the side margin portion of only a ceramic green sheet.

Therefore, uniform pressure is not added to the whole heavy object of a ceramic green sheet at the time of sticking by pressure. \*\* An internal electrode coat may separate from a ceramic green sheet (DERAMI nation). Moreover, there is a problem that the lamination portion with which the internal electrode coat of the chip which obtained it by having carried out dicing of the \*\* sticking-by-pressure layered product overlaps has weak intensity compared with the lamination portion of the side margin which does not include an internal electrode.

[The means for solving a technical problem]

In order that this invention may solve the above-mentioned technical problem, it has an elastic material layer and an adhesive layer at least. It is the elastic material sheet with the adhesive for electronic-parts manufacture which pastes up the worked object for electronic parts on this adhesive layer. The above-mentioned adhesive layer offers the elastic material sheet with the adhesive for electronic-parts manufacture prepared through the fizz material layer which foams to the above-mentioned worked object for electronic parts in contact with this adhesive layer so that it may exfoliate from this adhesive layer by heating. Under the present circumstances, as for an elastic material layer, being prepared possible [ separation ] is also desirable.

Moreover, this invention forms the sticking-by-pressure layered product of each heavy object by [ which piled up two or more ceramic green sheets in which two or more electronic circuit element coats were formed ] piling up and sticking at least one of the bodies by pressure. In the manufacture method of laminated type chip parts of obtaining laminated type chip parts through the process which performs dicing which divides this sticking-by-pressure layered product for each circuit unit of every the manufacture method of the laminated type chip parts characterized by making it intervene so that an adhesive layer may paste up the above-mentioned elastic material sheet with the adhesive for electronic-parts manufacture on each sticking-by-pressure layered product for every pile object which it is going to stick [ above-mentioned ] by pressure, and being stuck by pressure is offered -- it is.

[Function]

If the heavy object of the ceramic green sheet which the elastic material sheet with the adhesive for electronic-parts manufacture which has an elastic material layer and an adhesive layer is made to intervene, and has a circuit element coat is stuck by pressure and a sticking-by-pressure layered product is formed. Even if this heavy object differs in thickness by the

existence of a circuit element coat, it can equalize pressure by existence of an elastic material layer in the case of sticking by pressure.

Moreover, since the adhesive layer is prepared through the fizz material layer which foams to the worked object for electronic parts which contacts this adhesive layer by heating so that it may exfoliate from this adhesive layer, this worked object for electronic parts can be exfoliated from this adhesive layer by carrying out the foaming.

[Example]

Next, one work example of this invention is explained.

it is shown in Fig. 1 -- as -- the ceramic green sheets 1 and 1 -- leaving .. unfilled space by turns at the both sides and the right-and-left end of those -- the internal electrode coats 2 and 2 -- [ .. is formed, and these are accumulated and ] An internal electrode coat overlaps in the central part through a ceramic green sheet, and an internal electrode coat is pulled out by the right-and-left end for one layer of every ceramic green sheets.

In addition, a ceramic green sheet is what formed the slurry of the ceramic material which used BORIBINIRUBUCHIRARU as the binder by the doctor blade method etc., and an internal electrode coat is formed by screen-stenciling conductive paste to this.

40 sheets accumulate and pile up the ceramic green sheet with the above-mentioned internal electrode coat, and the body 3 is formed. As shown in Fig. 4 , these heavy objects 3 and 3 are accommodated in the mold 5 of bottom type of metallic mold 4, but the bottom of bottom type 4 is covered with the mold release paper (things which carried out release agent processing, such as a silicon compound) 6 in this case, and the elastic material sheet 7 with the adhesive for electronic-parts manufacture shown in Fig. 2 is piled up on it.

this elastic material sheet 7 with the adhesive for electronic-parts manufacture is what stuck the base material film 7a, the elastic material sheet 7b, and the foaming adhesive layer 7c with adhesives etc. -- the time of un-using it -- exfoliation -- it is prepared on the foaming adhesive layer 7c, and it is used by the easy separator 7d in this, exfoliating. That by which polyethylene terephthalate etc. has elasticity as the above-mentioned elastic material sheet, and is obtained from foaming objects, such as polypropylene, as the above-mentioned base material film again, for example is desirable.

It is what applied the adhesive to the charge of foam in which it will foam as the above-mentioned foaming adhesive layer if it heats at about about 100 degrees C, and NITTO DENKO CORP. make Nitto foaming exfoliation nature sheet NO.3195 series is mentioned, for example.

The elastic material sheet 7 with the adhesive for the above-mentioned electronic-parts manufacture turns the foaming adhesive layer 7c up in Fig. 4 , and is used, the above-mentioned heavy object 3 is piled up on it, and the still more nearly same mold release paper 6 as the above on it is piled up. Next, the upright insole board 8 is piled up and the mold release

paper 6, the elastic material sheet 7 with the adhesive for electronic-parts manufacture, the heavy object 3, and the mold release paper 6 are accumulated one by one like the above on it, and it presses, equipping with and heating the upper pig 9 of a metallic mold on it.

[ if it does in this way, the heavy objects 3 and 3 will be stuck by pressure, but ] Since the elastic material sheet 7b of the elastic material sheets 7 and 7 with the adhesive for electronic-parts manufacture exists in that case the internal electrode coats 2 and 2 -- even if it piles up by the case where only a ceramic green sheet exists and a difference is in the body at thickness when [ that ] .. exists between each layer of a ceramic green sheet, and it exists for every layer The difference in the pressure the heavy object by these differences is pressured is eased with the elasticity, and the pressure is equalized.

Thus, after piling up and pressing the bodies 3 and 3, it will pile up, if the upper pig 9 is removed and the thing in a mold 5 is taken out, and the bodies 3 and 3 are acquired as a sticking-by-pressure layered product, but since the mold release papers 6 and 6 are easily separable, the elastic material sheet 7 with the adhesive for electronic-parts manufacture remains pasting up to the sticking-by-pressure layered product.

If this is sent to a dicing process and dicing is performed here, it will be obtained while the sticking-by-pressure layered product for each capacitor unit of every had adhered to the elastic material sheet 7 with the adhesive for electronic-parts manufacture. Heat at about 100 degrees C in this state, the above-mentioned foaming adhesive layer 7c is made to foam, and each sticking-by-pressure layered product is exfoliated from this sheet. Thus, as for each obtained sticking-by-pressure layered product, a ceramic condenser is completed through a calcination process etc.

[ the sheet ] although the above-mentioned elastic material sheet 7 with the adhesive for electronic-parts manufacture could not separate the elastic material sheet 7b As shown in Fig. 3 , between the elastic material sheet 7b and the foaming adhesive layer 7c The adhesive layer 7e, It is used laminating the base material film 7f one by one, making it intervene, and having the elastic material sheet 7b at the sticking-by-pressure process of the above-mentioned heavy object. At a dicing process, the base material film 7f is separated from an adhesive layer, and it may be made to carry out dicing of the sticking-by-pressure layered product pasted up on the compound sheet which consists of a base material film 7f and a foaming adhesive layer 7c. If it does in this way, it is avoidable that an elastic material sheet exists and dicing work becomes unstable by the modification.

The elastic material sheet 7 with the adhesive for the above-mentioned electronic-parts manufacture was used when a lamination ceramic condenser was manufactured, but it is used for masking in the manufacturing process of a ceramic condenser, and protection of the surface in the manufacturing process of common electronic parts. When contacting other things also in these cases, it is effective as the object for a buffer etc. Moreover, it is used also

in the case of manufacture of lamination IC chip parts.

[Effect of the Invention]

Since it was made to stick the heavy object of a ceramic green sheet with a circuit element coat by pressure using the elastic material sheet with the adhesive for electronic-parts manufacture which has an elastic material layer according to this invention At a sticking-by-pressure process, while easing non-<sup>\*\*</sup> 1 of the pressure by the difference of a grade with which a circuit coat overlaps, the work can be done in a dicing process, without needing the work which attaches a pressure sensitive adhesive sheet. For this reason, while being able to save at 67% of conventional working hours although the same work is done since the conventional pressure sensitive adhesive sheet adhesion process is included in a sticking-by-pressure process and can be processed For example, non-<sup>\*\*</sup> 1 of the intensity by the exfoliation phenomenon of the internal electrode coat when obtaining the sticking-by-pressure layered product of a multilayer capacitor and the existence of the internal electrode of a lamination ceramic condenser calcinated and obtained is avoidable.

And the adhesive layer is prepared through the fizz material layer in which it will foam if it heats, and can exfoliate easily the worked object for electronic parts pasted up on this adhesive layer from that adhesive layer by that foaming.

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[Translation done.]